



Høgskulen  
på Vestlandet

# BACHELOR THESIS

## Do Future Leaders Hold Racial Bias?

## Er fremtidige ledere rasediskriminerende?

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### *Sammendrag:*

Gjennom årene har det vært flere studier om det fremtredende spørsmålet om rasediskriminering i ansettelsesprosesser. Vårt bidrag til denne problemstillingen er et lab-eksperiment utført på Campusene til HVL og BI. Vi ville undersøke om fremtidige ledere er diskriminerende i forhold til rase. Ut ifra denne problemstillingen, utførte vi eksperimentet vårt på universitetsstudenter som studerer en form for ledelses bachelor. Resultatene fra studien vår viser at det ikke eksisterer en rasemessig skjevhet hos universitetsstudenter, verken en forskjell mellom private og statlige institusjoner eller en forskjell mellom første- og tredje-års studenter. Imidlertid viste vår analyse en betydelig forskjell i hvilket kjønn deltakerne valgte. Pakistanske menn ble sjeldnere valgt i motsetning til de kvinnelige søknadene.

### *Stikkord:*

Rase diskriminering	Pakistanere	Rekruttering
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### *Abstract:*

Throughout the years there have been several studies on the prominent issue of racial discrimination in the hiring process. Our contribution to this issue is a lab experiment conducted on the Campuses of HVL and BI. We wanted to see if potential future leaders hold a racial bias. On the basis of this, we conducted our experiment on university students enrolled in some type of leadership bachelor's. The results from this study show that there is no existing racial bias among university students, neither a difference between private and governmental institutions nor a difference between first- and third-year students. However, our analysis did display a significant difference in the gender of the applicant which was chosen. Pakistani men were chosen far less than the opposing female applicants.

### *Keywords:*

Racial bias	Pakistani	Recruitment
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## Preface

This bachelor thesis is the final part of our Bachelor's in Economics and Administration at Høgskulen på Vestlandet. The thesis is an original work, written by Enes Gunay, Arshi Hasan, Reuben Sakarias Kjetland, and Helene Vederhus.

This thesis investigates the potential presence of racial bias toward Pakistani descent in the Norwegian labor market. The paper is based on an experiment conducted on the Campuses of HVL and BI. Our hope is that our research will further the discussion of how we as a society can minimize racial bias in the labor market.

We want to thank our advisor, Eirik André Strømmand, for his guidance and support through this process. Furthermore, we want to share our gratitude to the administrations at HVL and BI for allowing the experiment to be conducted at their premises – as well as all those who participated in our experiment.

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## 1.0 Introduction

Have you ever wondered if your name could affect your chances of getting hired? Recent studies have shown that racial bias in recruitment processes can occur simply based on the ethnicity of a candidate's name (Berg, L. W., 2020). It is a phenomenon that affects individuals of diverse backgrounds and can have a significant impact on their career prospects. In this context, the use of seemingly neutral criteria, such as a candidate's name, can result in discriminatory practices that perpetuate inequality and hinder diversity in a workplace.

Norway is often referred to as a country with minimal differences among its citizens, characterized by high levels of trust and security. The Norwegian government frequently emphasizes the importance of inclusive communities that encourage dialogue, freedom of speech, and diversity (Norwegian Ministry of Culture, 2018). However, despite these ideals, racism, and discrimination remain significant challenges. In spite of Norway's reputation as a tolerant and inclusive country, ethnic minorities still face various forms of discrimination, as evidenced by studies (Bertrand & Mullainathan, 2004; Midtbøen, 2014). These include prejudice or negative attitudes towards individuals of different ethnicities, which lead to social exclusion and create obstacles to full integration into Norwegian society. Additionally, ethnic minorities may also experience disparities in the interview process, promotions, and wages when employed. Discrimination in the housing market is also a concern, as minorities may be denied housing or offered unfavorable conditions. Hate speech, harassment, and violence are other forms of discrimination suffered by ethnic minorities in Norway (Norwegian Ministry of Culture, 2018).

In recent years, there has been a growing awareness of racism in Norway and policies have been implemented to combat it (Norwegian Ministries, 2020). Discrimination in various sectors of society, such as housing, employment, and education, has been addressed through government policies and initiatives. These measures include implementing anti-discrimination laws, establishing a national action plan against racism and discrimination, and funding projects that promote diversity and inclusion (ibid.). It is important to acknowledge the progress that has been made in combating racial bias in Norway. However, there is still room for improvement to create a more inclusive and equitable society for all.

Although the subject is broad and far-reaching, we have chosen to concentrate on two primary research questions.

*“Do future leaders hold racial biases?” &*

*" If so, is there a relationship between the educational system and a possible racial bias?"*

To answer these questions, data collection will take place among students enrolled in leadership courses at different universities in Bergen. Having this target group is for the purpose of expecting them to take the lead in the future hiring process for upcoming employees. By examining these questions, we can get a sense of what the near future might look like. In the first part of our study, we will investigate whether the young generation of potential leaders holds racial bias, while in the second part, we will look deeper into the study and compare first-year and third-year students' thinking on the topic. As part of this analysis, it will be determined whether educational studies help to prevent racial bias among students, promote it, or has no effect whatsoever.

A high degree of importance is attached to the problem and rationale for pursuing this study. Terms such as racial bias, discrimination, stereotypes, and racism in education have an extensive history. A growing body of evidence suggests racial biases are important contributors to disciplinary practices in society and in education. It is clear from previous studies and research that racial prejudice hinders many people from participating in society and developing their skills, whether this be at work or in other social activities. While the challenges people face may differ from person to person, they eventually share some commonalities. Whether explicit or implicit, racial bias creates fear and undermines the trust needed to protect and develop healthy, positive, and inclusive communities. In other words, it is a threat to the Norwegian society, its values, principles, and ethics. Therefore, it is critical for us to be aware of racial bias in society and its direction of development, which is what will ultimately determine the future.

As mentioned earlier, the racial bias phenomenon is already a prevalent factor in society. The purpose of this study is to measure the level of progress in addressing this issue. Specifically, the research aims to provide potentially valuable insights to the Norwegian society and government regarding the effectiveness of their efforts and measures in the education system. With this information, future plans can be made with more accuracy and rationality, allowing a better understanding of the progress made. This study not only proposes statistical results on the given problem statement but also a thorough discussion of different perspectives of the results. Although this study specifically concentrates on racial bias in recruitment processes, future research is expected to expand to include other forms of racial bias in different sectors.

This thesis will begin by reviewing and examining related studies that have provided us with valuable insights and a strong foundation for our research. Thereafter, a discussion of the theoretical framework will be presented, which will include a clear definition of the term "racial bias", a brief history of Pakistani immigration to Norway, and an assessment of the current situation regarding racial bias in Norway. The next segment of this thesis will focus exclusively on the experiment, which will include a discussion of the assumptions and limitations of the experiment, as well as a thorough description of the experimental design and methodology. Thereafter, the results obtained from the experiment will be presented in detail. The last section of our thesis will outline a discussion of the results and possible experimental errors – providing an analysis and interpretation of the findings –, and finally, a conclusion.

## 2.0 Related Studies

In newer times, there has been an increase in experimental studies on possible racial bias in the hiring process and in the labor market in general. Some look at the difference between countries, such as Edvard N. Larsen and Valentina Di Stacio's study comparing the UK and Norway (Larsen & Di Stacio, 2019). Other studies, such as Marianne Bertrand and Sendhil Mullainathan's, look at discrimination towards one of the most prominent minorities in a specific country (Bertrand & Mullainathan, 2004).

### 2.1 Emily or Lakisha?

The main study from which we drew inspiration was Marianne Bertrand and Sendhil Mullainathan's study; "*Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination*". Their study was conducted in two American cities, Chicago and Boston. Bertrand and Mullainathan concluded that there exists discrimination on names in recruitment processes in these cities. These results are based on their field experiment which was executed by sending out 5 000 résumés with fictional identities to approximately 1 300 real employees who had announced job positions within the last six months (Bertrand & Mullainathan, 2004).

Every employer received four fictional résumés, where each of the résumés was designated a random given name which was either a characteristically "white sounding" or "black sounding" name. The uncontrollable variable in their study was that they did not have a record of how many real applications each business received. To confirm that the names fell among one of these groups they surveyed the public to describe a person based on a name, where ethnicity was one factor people had to answer. This created the foundation for the names used in their



study. In our study, we will use Pakistani names but without the use of a survey to confirm that the names are associated with Pakistani immigrants. This is because the difference between Norwegian and Pakistani names is vastly different than white American and Black American names are to one another. Another factor is that we simply do not have the resources or the time to execute this type of survey. As mentioned, each résumé was designated a randomly given name, with both races equally represented – a 50/50 distribution. In that way, they ensured that there were no actual differences in quality among the résumés between the “black” and “white” names (Bertrand & Mullainathan, 2004).

The résumés were categorized into two sets of qualities: (1) high-quality, a résumé with higher education and experience, and (2) a low-quality résumé, with less experience and less voluntary work. Blacks and whites were equally represented in both the high- and low-quality groups of the résumés (Bertrand & Mullainathan, 2004, page 6).

In order to measure a valid response, Bertrand and Mullainathan registered the number of “callbacks” each résumé received from an employer (Bertrand & Mullainathan, 2004, page 2). A “callback” is described as an employer reaching out over the phone or by e-mail to set up an interview with the fictional applicant. In short, of what we consider the most interesting results, they found that white applicants received 50% more callbacks than black applicants. As a result, white applicants could expect one callback for every tenth résumé which was sent out, while black applicants could expect one callback after sending out fifteen résumés. Furthermore, a white applicant with a high-quality résumé will have a higher “callback” rate than a black applicant with a high-quality résumé which equals eight additional years of work experience for a black name résumé (Bertrand & Mullainathan, 2004, page 3).

As our bachelor thesis is titled, we have formulated the research question “Do future leaders hold racial bias?”. To research this topic with the inspiration of the mentioned study, we had to modify the experiment to a Norwegian setting. Since Bertrand and Mullainathan’s study was based in Chicago and Boston, it picked up elements from the cultures in New England and the “Rust-belt” in the United States of America – some of which are different from the culture and lifestyle in Norway. To properly address which elements, we have been inspired by, we will explain each step - in detail. We will also address the main challenges we faced by modifying a large-scale study with over 5 000 applicants to real jobs, in a lab experiment at Norwegian universities in a controlled environment (Bertrand & Mullainathan, 2004, pages 8-9).

First of all, we want to point out the use of race-based names. In Bertrand and Mullainathan's study, the name categories for the races were based on the racial minorities in Chicago and Boston (Bertrand & Mullainathan, 2004, page 6). The backgrounds of minorities in these cities are different from the minorities in Norway. In Chicago, people of African American descent make up 29.9% of the city's population while whites take up a share of 45.3% (US Census, 2022a). In Boston, African Americans make up 23.5% of the city's population while whites alone are 50.1% (US Census, 2022b). The remaining percentages in both cities are people with backgrounds from Asia, Hispanic countries, Alaskan natives, Native Americans and Native Hawaiian, and people with parents from two different races. One may point out that these numbers are from 2021. This indicates that since Bertrand and Mullainathan's study in 2004, the Chicago population has declined significantly (Population decline). The ratio of blacks to whites has therefore changed since then. However, the point we are trying to state is not the ratio of blacks to whites itself, but the background of minorities and the names connected to that minority. Since Americans of African descent have different names than the names typically associated with immigrants to Norway and their descendants, the name base is one of the main elements we have changed to fit our context.

One of our main challenges in using Bertrand and Mullainathan's study as a basis for our experiment was to transform it to fit within the boundaries of our bachelor thesis - in terms of time, resources, and knowledge. To overcome these challenges, we looked further into which parts of Bertrand and Mullainathan's study we would need to modify. Their study merely concluded that there exist racial biases on names in recruitment processes, but it did not highlight where the development of racial biases takes place. This is the foundation for building our bachelor thesis "Do future leaders hold racial bias?", as we want to see if there is a relationship between racial bias and what students learn at universities. This raises an important question; Who are our future leaders? We want to clarify that we do not mean politicians, future prime ministers, or people with high-profile jobs. Instead, we are referring to leaders who are "handed" the stack of CVs sent to a company for every job opening, the leaders in charge of HR- departments, and small business owners who conduct the recruitment process on their own. To identify the qualifications expected of leaders are expected to have today, we looked into job openings for positions within leadership. Most job openings require that the applicant have a bachelor's or a master's degree in economics, administrative or leadership studies, and/or substantial previous work experience. Thus, for our experiment, we chose to identify our future leaders as those who are enrolled in these types of studies.

As mentioned, Bertrand and Mullainathan's study sent résumés to approximately 1 300 employers in Chicago and Boston. However, "Table 2" in their study shows that 82,56% of the employers did not give a "callback" to either a black or white résumé (Bertrand & Mullainathan, 2004, table 2). This can be translated to what we would like to call a "response rate". Bertrand and Mullainathan's study's response rate would then be  $(1-82,56\%) = 17,44\%$ . In our experiment, the response rate is 100% since our test subjects must choose between four fictional candidates that we have randomly generated. This means that their experiment was based on the responses from only 226 employers.

## 2.2 Other Relevant Studies

There have been quite a few studies on underlying racial bias in the hiring process. Many are based on the political environment in the United States, and bias towards black people. However, in this thesis, we will focus further on the studies surrounding Nordic countries and the bias toward Pakistani people in Norway. In an experiment by Larsen & Di Stacio, they looked at the hiring discrimination towards Pakistani groups in the UK and Norway. What they found was that in both countries Pakistani applicants received significantly fewer callbacks than "native" applicants – even less if they were affiliated with Islam (Larsen & Di Stacio, 2019).

Ethnic inequality in labor markets affects not only immigrants themselves but also their second-generation children who are native-born and raised in the host country. An important detail to be mentioned about the second generation is that they most often than not are linguistically fluent and have formal education (i.e., Norway) (Midtbøen, 2014). This information gives room to believe that children of immigrants should be seen on the same level as applicants in the same age range, experience range, etc., who are (here) of Norwegian descendants. SSB has conducted several studies on people with immigrant backgrounds over time, and until 2006, no study has been conducted on Norwegian-born of immigrant parents. Some of these studies show that Norwegian-born with immigrant parents has a lower chance of getting a callback compared to someone with a non-immigrant parent with the same qualifications (Ugreninov et al., 2014). These results align with the outcome of the study in 2012 which showed discrimination by foreign-sounding names. It is evident that even the second-generation experiences discrimination based on ethnicity, even before having been called for an interview. One of the best-known examples which focuses on this form of discrimination, experienced by children of immigrants, is Arnfinn H. Midtbøen's *Discrimination of the Second Generation: Evidence from a Field Experiment in Norway*.

The experiment design in Midtbøen's study involved creating résumés and cover letters that were relatively equal in relevant elements, except for the names. The objective was to develop candidates suitable for the open job position, who were different from each other but equally reliable. These fictitious applicants possessed similar experience, skills, and educational qualifications, which met the requirements of the job listings. An important element to mention is that each résumé was written in fluent Norwegian, as to reflect that every fictitious applicant grew up in Norway. The only significant difference between the fictitious candidates was therefore the name. The fictitious résumés were sent out in pairs, one with a Pakistani name and the other with a Norwegian one, to actual job postings. They were distributed through platforms such as finn.no and nav.no. Midtbøen measured the results in the number of interviews that were received, through email, phone, or text. The results of Midtbøen's study show that people with Norwegian names are (on average) 25% more likely to receive a callback than an equally qualified Pakistani (Midtbøen, 2014). Midtbøen's results on the second generation indicate that during the hiring process, a name and its associations may carry more weight than most other elements on a résumé.

Given that Norway has a social-democratic stance that focuses on equality, one would think that there would not be many issues with the integration of children of immigrants – despite Midtbøen's results. However, migration to Norway started roughly around the second half of the 19<sup>th</sup> century (Myhre, 2021). Because of this, Norway is rather new to immigration and the integration of the second generation – compared to other Western nations. This could imply that there might be a higher level of discrimination towards immigrants than initially believed, which we see a reflection of in the results mentioned above. Based on these contradicting characteristics, Midtbøen claims that the Norwegian labor market is an interesting baseline for studies on racial bias (Midtbøen, 2014).

Midtbøen goes on to state that the labor market in Norway, similar to countries such as Britain and Sweden, shows the highest level of disadvantage barriers at the entrance level. In other countries such as Germany, Austria, and Belgium, the “second generation” experience disadvantages even after they have been hired for the position (Midtbøen, 2014). Because of this, we are interested to see whether racial bias still exists in today's hiring process or if Norway's social-democratic values have successfully mitigated past discrimination.

Given that our study focuses on the discrimination towards people with Pakistani background, it is particularly noteworthy that 22% of “second-generation” participants in SSB's study in 2016 claimed to have been rejected because of their ethnical background. In this group,

Norwegians of Pakistani and Sri Lankan descent make up namely the largest and second-largest groups of the total participants (SSB, 2016). Likewise, a previous study showed the same results where Norwegians of Pakistani descendants represent the largest portion of people who felt discriminated against because of ethnical background (Tronstad, 2008). According to an SSB report in 2016, women reported discrimination by 18%, whereas men reported a 25% discrimination rate in the hiring process in the last 12 months. Among women, Norwegians of Pakistani descent account for the most discrimination claims, while Norwegians of Sri Lankan descent constitute the largest group among men. These findings indicate that Norwegians of Pakistani and Sri Lankan descendants constitute a great percentage of total reports, almost half of the total reported discrimination claims.

In our experiment we decided to use stereotypical Pakistani names, to explore the validity of the previously mentioned studies in the present day. The plausible error with these studies is that the results are based on the participants' perception that they were qualified for the jobs they applied for. We also assume that there must be many other qualified applicants for the position who got rejected. Additionally, names are not only associated with a person's ethnic origin but also their religion, personal, and historical connections. Therefore, the term "racial bias" in our experiment includes prejudice and discrimination against both ethnicity and religion. For that reason, we also looked into which religious faith Norwegians tend to exhibit the most skepticism towards.

A survey called "Integreringsbarometeret 2020" showed that almost half of the Norwegian population is skeptical of Muslims, whereas respondents stated that they are far less skeptical of Buddhists. Researcher Jan-Paul Brekke says that it may be that people's skepticism towards those of the Muslim faith is influenced more by their perception of Islam, rather than simply by the fact that it is a foreign religion. Furthermore, the same study shows that 56% of respondents were negative about having a daughter-/son-in-law with a Muslim background while 26 percent were negative about having a daughter-/son-in-law with a Buddhist background (Schwencke & Kallelid, 2020). We know that Buddhism is the most predominant religion in Sri Lanka whereas Islam is the official and most predominant religion in Pakistan. Hence, we decided that choosing names that are both most associated with Islam and Pakistan would be most relevant in our experiment.

## 3.0 Theory

It is widely acknowledged that biases have the potential to impact an individual's thoughts, attitudes, and social interactions. Throughout life, people accumulate a variety of experiences that shape their biases. People create their own subjective social reality based on their perceptions of the world (Nikolopoulou, K, 2023). The term bias refers to traits, inclinations, or prejudices that are favorable or unfavorable to something or someone. In other words, we have a bias when we prefer or resent a person or group of people, rather than being impartial (ibid.,). It is possible to have biases that are positive. The practice of placing too much emphasis on positive information is called positive bias (Sears, D.O, 1983). Though, there is a fine line between being optimistic and being positively biased. An optimistic attitude is a tendency to see the good and the potential in a situation. The decision to side-line negative information is not necessarily a bias, since one may realize unfavorable information exists but choose to do so strategically. However, denying the existence of negative information or its relevance can easily become a bias (ibid.,). An example would be someone who only focuses on positive information about a company due to their optimistic outlook on it. This may obscure risks and negative aspects of the firm's actual performance.

In contrast, a negative bias is having an unfavorable view toward someone, or something based on a feeling rooted in fear, suspicion, or intolerance. Researchers have found that even when the positive and negative information is balanced, people tend to focus more on the negative information when they are trying to make sense of the world (Sears, 1983). Negative bias can be demonstrated by people's tendency to recall and reflect on insults more than compliments, or by dwelling more on the unpleasant rather than the pleasant events.

The experiment we conducted examines "racial bias", which can result from both positive and negative bias. "Racial bias is a personal and sometimes unreasoned judgment made solely on an individual's race" (Williams, S.A, 2011). In other words, racial bias occurs when people assume certain characteristics about others based on their racial background. For instance, assuming Asian students are adept at math or Africans are violent individuals. Racial bias and stereotypes are prevalent in many workplaces. The outcome can lead to discomfort, a lack of opportunities, and an increase in anxiety at work for underrepresented racial minorities. Therefore, regardless of whether the biases are positive or negative, such cognitive shortcuts in most cases result in prejudgments that lead to rash and unfair decisions or discriminatory practices. Stereotypes are more often to blame for biases than actual knowledge of the individual or situation. Although there are fewer of us who believe in the intrinsic superiority

or inferiority of particular races in modern society, we are all prone to thinking and acting in certain ways based on racial biases.

It should also be noted that there exists a division between "preference-based discrimination", and "statistical discrimination", and these two forms of discrimination can manifest differently. Preference-based discrimination is what we usually recognize as a "pure" form of racial bias. It results from typically biased prejudices towards individuals or groups based on their gender, ethnicity, race, or other characteristics. On the other hand, we find statistical discrimination which occurs when decision-makers in recruitment processes rely on mainstream stereotypes or generalizations about a group's average characteristics to inform their decisions (Guryan & Charles, 2013). While preference-based discrimination is commonly considered to be the "pure" form of racial bias, it is important to identify that statistical discrimination can also contribute to racial bias. For instance, if statistics imply that Pakistanis have a lower success rate in a particular activity, decision-makers may unconsciously or consciously discriminate against them as a group. This may result in individuals being subject to consequences based on the characteristics of a larger group that may not accurately represent their individual abilities. In our study, we will not be able to distinguish the effects of preference-based discrimination from statistical discrimination due to experimental limitations.

Norway has become a more multicultural country with a significant population of immigrants and their descendants, making it especially relevant to understand biases and their impact on our perceptions and interactions with others in order to create a society that includes everyone across all races and ethnicities. Further, we will highlight the historic background of immigration to Norway. This is to see the link between how racial bias used to be in the country, how it is today, and to interpret how it will be in the future.

### 3.1 History

The initial first-generation Pakistani Norwegians arrived in Norway in the mid-1960s. However, the significant influx of immigrants from outside Europe began in 1971 when roughly 600 people arrived in Norway, most of whom were Pakistani (Hetland, A, 2021). Norway's liberal immigration scheme at the time allowed unskilled "guest workers" to settle in the country for a limited amount of time. Several factors in the Pakistani context played a role in forcing people to embark on perilous journeys to Europe. Examples include a lack of economic development, a fragile security situation, regular natural disasters, and political instability in Pakistan. Consequently, higher education and skilled employment opportunities were limited.

Migration to other parts of the world became primarily the result of limited economic development and job opportunities (Saleem, A, 2020).

It was mostly Pakistani men in their twenties who came to Norway, taking jobs as foreign workers. They willingly accepted jobs that indigenous Norwegians had difficulty filling, including factory workers, cleaners, bus drivers, conductors, and other manual occupations. Those who learned Norwegian quickly transitioned into higher fields, such as vegetable markets, leather products stores, downtown corner shops, etc. (Hetland, 2021). Initially, these workers had planned to stay in Norway for a few years, save as much money as they could, and then return to Pakistan. However, their plans soon changed. A later amendment to the law allowed guest workers who had already arrived in Norway to permanently settle there. In addition, Pakistanis' decision to settle in Norway permanently was also prompted by their discovery that salaries in Norway were quite reasonable and that they had access to a wide range of health services and other welfare benefits (ibid.,).

Upon the passage of the 1976 immigration law, Pakistani immigration to Norway was shifted from the arrival of new immigrants to family reunification, in which Pakistani Norwegians could apply for their spouses and/or close relatives to immigrate to Norway.

The evolution of immigration in Norway, from the arrival of Pakistani guest workers to family reunification and the current multicultural landscape, reflects a shift in attitudes towards immigration. Initially, immigration was seen as a means to fill labor shortages, but over time immigrants have become an integral part of Norwegian society. Today, Norway is a more multicultural country, with a diverse population of immigrants and their descendants. According to Statistics Norway (SSB), the population of immigrants and their descendants has grown steadily over the years, reaching 1 091 037 in 2023, which accounts for 19,9% of the total population (SSB, 2023). Findings from the European social survey show that Norway and other Scandinavian countries are placed on top in levels of support for immigration. SSB publicized supportive results of research on the issue in 2019, which indicated that seven out of ten agreed that immigrants enrich Norwegian society culturally. This report also showed a not-so-surprising fact, that it was mostly the young, highly educated, and women who expressed these positive opinions about immigration (Strøm, 2019).

One might assume that these positive opinions are also to be found in the labor market in Norway. However, several studies show that this is not the case. Racial bias in the labor market was investigated by sending out 1 800 fictitious job applications with the same qualifications



as real jobs' advertisements in 2012. The only difference in the applications was the names that signaled different ethnic backgrounds. Similar to our experiment, their study also compared Pakistanis to Norwegians, by choosing the most common names in each ethnic group. The results showed that foreign-sounding names reduced the probability of a callback by around 25% (Hansen, 2021). The extent of such discrimination appears to be higher than one would expect based on the SSB statistics mentioned above.

While Norway has made efforts to welcome immigrants and refugees and encourage their participation in the labor market, studies have shown that racial bias still exists. This is revealed by the lower probability of callbacks for job applications with foreign-sounding names. Nonetheless, participation in the labor market and learning Norwegian are viewed as key factors for the successful integration of immigrants into Norwegian society. Additionally, while integration into Norwegian society is considered crucial, the results of "Integreringsbarometeret" in 2020 revealed that a considerable percentage of the population has negative views towards integration policies, with only 20% of the population viewing such policies as successful (Brekke et al., 2020).

Although research, such as Anthony Heath & Lindsay Richards' study, indicates that Norwegians express positive thoughts about cultural differences, immigrants with high education are reported to have challenges finding relevant jobs in their expertise (Heath & Richards, 2019). It has been reported that 40% of immigrants with high education have jobs which they are overqualified for (Edelmann & Villund, 2023). Furthermore, a Swedish qualitative study showed that employers consider immigrants with a high level of competence as a potential threat to an organization's norms and practices (Risberg & Romani, 2022). The employers stated that it was hard to verify the authenticity of immigrants' documents, such as diplomas and references, etc. It was also mentioned that the lack of skills, such as language skills, is perceived as a factor that could cause ineffectiveness. Based on this, levels of language skills, cultural adaptation, and verification problems primarily cause overqualified immigrants to be unable to obtain their desired positions. Consequently, these overqualified immigrants cannot optimally exploit their knowledge and skills. While we need qualified labor in many industries and areas, having overqualified individuals working in irrelevant jobs can reasonably be seen as a loss for society. This further underlies our hypothesis about there still existing racial bias in the Norwegian labor market today.

## 4.0 Method and Experimental Design

### 4.1 Target Group

The target group in our experiment includes students who are studying for a bachelor's within management and leadership at HVL (Høgskulen på Vestlandet) and BI Norwegian Business School. As mentioned previously, the main objective of the experiment is to compare the degree of racial bias among first- & third-year students. Hence, our experiment will focus on gathering first- and third-year students through a self-selection process. Here we will compare the two to see if there is a difference between them, and if their racial judgment might be impacted by the leadership courses they have taken. We will also do a secondary examination of the data where we will look at the relationship between gender and race. Initially, we wanted to draw a selection that represented all Norwegian students studying management and leadership, to lay a strong foundation for the most accurate results. We recognize that cultural values can vary from place to place. If the experiment had been conducted in different cities and at a broader range of universities, it would have allowed for more diverse data to be collected. As we do not have the opportunity to conduct such a lengthy experiment, we have chosen to limit ourselves to HVL and BI in Bergen as the main and only location for the experiment.

### 4.2 Selection Methods

In our experiment, we chose to make use of a variety of selection methods. Our study falls under the category of selection studies, where we look into smaller selections of units within the population in which we are interested (Grønmo, 2021). In our case, we cannot perform the experiment on every student in the country who studies a leadership/administration bachelor. Therefore, as mentioned, we have narrowed it down to students in Bergen – and more specifically at BI and HVL. We have also narrowed it down to only first- and third-year students, within the criteria, because we were interested in seeing if there is a difference between the two groups. As shown in Appendix 12.5, our questionnaire includes a question about which grade the participants are in. From this point, we have then only included the ones enrolled in the first or the third year. Despite that, we cannot be sure of whether or not the participants are truthful on this matter.

When we narrowed down our sampling pool, we got smaller units that would be a representation of the population. One of these units is our randomized sample of leadership (etc.) students at BI and HVL. This selection also falls under probability sampling, which is thought to give every student who studies bachelor's in leadership an equal chance of being in the selected sample.

The idea here is that we will get an accurate estimation that could represent the population. This is the reason behind needing 200 test subjects. We need to have a large enough sample so that we have enough statistical power to draw our conclusions back to the whole population – solely based on our sample (Liza, n.d.). In addition to this, we want to reduce the chance of committing a type II error, i.e., accepting a false null hypothesis, and we find that the easiest way to do this is by having a larger sample size.

One of the methods we use is simple random selection. Through this sampling technique, we pick people at random who are within our chosen population (Liza, n.d.). For us, this means that when we are stationed at the universities of our choice, we pick people within our target group randomly and ask them to participate. This technique was primarily used at HVL.

Another method we will apply in our selection is convenience sampling. The idea here is that we recruit those who are easily accessible and present where we execute our experiment (Statistics Solutions, n.d.). We cannot with full accuracy predict who will be at the two schools at the time of our experiment. Therefore, there will be a randomized selection of who chooses to attend the school that given week. In addition to this, at BI we are to be stationed outside the cafeteria, and the people who walk past us will be the most accessible and our main sampling pool at this university.

The third method we make use of is self-selection. This method entails that the individuals in our target group get to choose whether or not they want to participate in the experiment (Liza, n.d.). Given that we will post our recruitment text, (see appendix 12.2), on several social media platforms, people can decide for themselves if this is something that sparks their interest. Furthermore, since we are to conduct the experiment throughout an entire week, people will have the opportunity to participate on a day that fits their own schedule best.

### 4.3 Experimental Design

Our experimental design is inspired by “*Are Emily and Greg more employable than Lakisha and Jamal?*”. The experiment will be conducted on one hundred first-year students and one hundred third-year students studying leadership, economics, administration, and other university studies related to recruitment. These students are volunteers and will be asked to read a hypothetical case text (see Appendix 12.1) about them being employed at a company that is looking for someone to fill a senior insurance consultant position. They are to select the candidate they find the most suitable for the role from a set of four CVs. After they have chosen a candidate, the name associated with the CV will be registered and the experiment will be

restored to its original setting. The random selection of CVs includes a 50/50 distribution of Norwegian and Pakistani names.

Our experiment consists of several components to collect data. The components are as follows: (1) Creating a bank of Norwegian and Pakistani identities, (2) Creating a bank of CVs, (3) The physical layout and elements, & (4) Procedural instructions to ensure continuity. By creating two distinct banks for names and CVs, we ensure that there is equal qualification across both name groups by randomly assigning a name to a CV.

#### 4.3.1 Creating a Bank of Résumés

To create a bank of identities, we had to decide which characteristics an identity should comprise. Bertrand and Mullainathan focused on giving the résumés a detailed identity that reflected a real one (Bertrand & Mullainathan, 2004, page 6). They mentioned that it proved challenging to create realistic and representative résumés while not compromising the identity of the real résumés they were inspired by. To solve this, they altered the résumés ever so slightly (Bertrand & Mullainathan, 2004, page 6).

It could be argued that by altering the résumés they deceive the employers. To be able to collect data that accurately reflects how employers behave in real recruitment processes, it would be essential in Bertrand & Mullainathan's study design to make the employers believe that the resumes are real. This type of experiment would not be possible to conduct if the employers were informed or suspected that the résumés were fictional.

In our own experimental design process, we too had problems with deception. Before conducting our experiment, we had to get our experimental design approved by an organization called SIKT. Their job is to go over our design and ensure that we uphold their ethical standards and that we do not cross any lines by collecting unnecessary personal information from participants. When we first submitted our design, we had to alter certain elements in our original design which SIKT stated could cause deception problems. Their major concern was that we deceived the volunteers by presenting fictional CVs. We made sure to avoid this type of deception by clearly informing the volunteers that the CVs were fictional. They were also concerned that we, with our original design, would be able to link each volunteer to their choice of applicant. To fix this problem we separated personal information about the volunteer and their answer by registering the data on different forms that were collected in separate piles. We had a few rounds back and forth before they approved our design and decided that the deception problems were not a concern anymore.

Given that Bertrand and Mullainathan sent résumés to real employers and job notices, their need for realism was much higher than it is in our experiment. We, however, benefit from “controlling” the employer, while also conducting the experiment in a more controlled manner. Our CVs do not compete with other real applicants, so the CVs we create do not require the same level of realism to gain the attention of a potential employer. We also find it important to address that the student who takes the role of an employer knows that they are part of an experiment. For these reasons, we are able to have a lower level of realism in our experiment and we can therefore exclude certain factors which were used in Bertrand and Mullainathan's study. These factors include work gaps, diplomas, emails, Norwegian zip codes, and phone numbers (Bertrand & Mullainathan, 2004, Page 6).

Up until this moment, we have used résumés to describe the papers the test subjects are going to be exposed to. This was to help us address and translate the study mentioned above to our own setting. In our experiment, we have been using CVs in the way Bertrand and Mullainathan used résumés. We are using CVs since they give us greater control over the characteristics exposed to the volunteer. Our CVs would also be presented to the test subjects as hypothetical, in order to shield us from a higher level of deception.

It is important to address that the point behind spending effort in the design of the CVs is to make them different from each other and at the same time relatively equal in qualification. The CVs include the fictional applicant's college degree, work experience, volunteer work and work alongside school, computer skills and other special skills, and language skills. Before introducing how we created these fictional identities, we will explain the details behind every characteristic we chose to include (Bertrand & Mullainathan, 2004, Table 3).

When we designed our CVs, we suspected that a difference in the applicant's education could potentially affect the test subjects' choice. We wanted to avoid the participants focusing their attention on the educational level of the applicants, instead of the names. Therefore, to ensure that the applicant with the best education is not favored, we decided to give all the CVs a master's degree.

We created fake master's programs, inspired by different real master's and relevant job notices. The reason for this is that we wanted to avoid a highlighted focus on the actual master's degree so that the participants did not base their decision on the degree rather than the name of the applicant. By creating fake master's programs, we simply tried to eliminate a possible error. Another key factor is that in our context, there are two possible ways racial bias can operate.

The first scenario is that racial bias only operates in a situation where the participant is unaware of the applicant's place of study. If this was true, a design with fake master's programs would ensure that we are able to pick up on a possible racial bias. In the second scenario, racial bias would operate as normal – regardless of whether one is aware of the university name or not. Here, either a design using a fake master's or one with a real master's program would allow us to detect a possible racial bias. An advantage of our approach is that our chosen experimental design would therefore be able to pick up racial bias in both scenarios, which would not be the case if we used a design with real master's programs. For these reasons, we ended up excluding names of universities and only including the name of a fake master's program on the CVs. The degree names are built up using 4 randomly generated words from real master's names, that together make up a fictional degree such as “Master's in Corporate Economics” or “Master's in Financial Analytics” (see appendix 12.7.2).

When it came to work experience, we encountered the dilemma of whether or not to include company names. Since experience from one company could be viewed as more valuable than experience from another, we found it challenging to classify work experience in a manner that makes it equally valuable. If the association with a company has a large enough effect on a participant's choice, it could arise as a possible error. Because of this, we decided it was easier to just avoid company names altogether, and the CVs were simply given “relevant work experience” measured in years. The number of years given the CVs is randomly generated in Excel, centered by a median value with an upper and lower limit so that the CVs will approximately have a similar amount of work experience.

Volunteer work and work in schools are also factors we have included in the CVs. They are generated in a similar manner as the work experience through random generation in Excel. These characteristics may not be directly relevant to the job opening in our case, but they serve the purpose of complimenting the CVs that are randomly given a lower limit work experience than the others.

We wanted all our CVs to be categorized as “high quality” similar to how Bertrand & Mullainathan assigned their résumés to categories based on the quality of the résumé. In order to avoid large gaps of value between the characteristics in each CV we set a median value for each characteristic, such as a median of 8 years of work experience. We then randomized values within a 10% upper and lower limit from the median and assigned the value to a CV. The same technique was used for work in school, voluntary work, and the candidate's age.

In order to make the CVs differ even more in the eyes of the volunteers, we also included computers and other special skills (see appendix 12.7.4 and 12.7.5). Each CV is given three computer skills and two other skills. Skill numbers 1 and 2 in each group are basic skills that are expected to be in every CV, such as mastering Microsoft Office. The third computer skill is randomly picked from a list of computer skills that are different from each other, but equally valuable. Our hope is that this will make it harder for the volunteer to favor an applicant by possessing a certain set of skills. The other special skills follow the same setup as computer skills, but with having a driver's license assigned as a number 1 skill and a random selection between different made-up randomized courses as the second skill.

In Bertrand and Mullainathan's study, they view foreign language skills as a high-quality characteristic in their résumés. Because of this, we chose to include a foreign language as a skill in all our CVs, meaning that every applicant fluently speaks three languages (see appendix 12.7.3). The CVs which were given a Norwegian-sounding name have Norwegian as their first language, and English as their second. The third language will be randomly selected between German, French, and Spanish, given that these are the most common languages Norwegian students can choose from in high school. The CVs with Pakistani-sounding names will also be given Norwegian and English as their first and second language. Their third language will be randomly selected between Urdu, Pashto, Hindi, and Arabic. We chose Urdu and Pashto because these two are among the five biggest languages in Pakistan. Hindi and Arabic were chosen because most people will recognize these languages as ties to both the Middle East and South Asia, which surrounds Pakistan. Since Pakistan is a Muslim country, it also seems natural to include Arabic in our selection – given that this is Islam's religious language (Nag, 2019). At first, we considered only assigning each CV two languages – Norwegian and English, and Norwegian and Pakistani language. However, given that English could be viewed as an essential skill, the volunteer could favor English speakers. For this reason, we chose to give all applicants three languages – where English is their second.

A factor we considered in the decision of the third language assigned to the applicants was the difference in value connected to each language. One could argue that the European languages are more valuable to a Norwegian company, seeing as they may have business partners in Germany for example. If we had randomized the third language regardless of the racial group, we could have avoided this problem. However, we believed that Norwegian names having Pakistani languages would seem unrealistic to the identity of the CV. On the other hand, it would not be nearly as unrealistic to assign a Pakistani name with a European language, as our

applicants are thought to have gone through Norwegian schooling where they would have had to choose a European language. It is therefore not unlikely that a Pakistani would speak more languages than a Norwegian applicant. However, we believe that if we gave the Pakistani CVs an extra language it would give them an advantage, which is why we chose to limit all the CVs to only 3 languages. In addition to this, we also chose not to specify a possible international business partner connected to the firm in the case text, to avoid the possibility of the participants viewing one language as more “worth” than another.

It should be noted that we consider this argument to be vague as the Norwegian economy is heavily based on oil and energy. Languages such as Arabic are as important as German in these industries. Our fictional job opening also does not specify who the customers of the insurance company are, thus making it impossible to base the value of the language on the need of an industry. The value of the language would then be based on the subject's own association with the language. We also believed that by excluding European languages as a third language for Pakistani applicants we strengthen the Pakistani identity and further enhance any existing prejudice.

#### 4.3.2 Creating a Bank of Fictional Identities

In the creation of fictitious identities, we randomly generated one hundred identities. Fifty of them belonged to the Norwegian group and fifty to the Pakistani group. In addition to the creation of fictitious names, we also added other attributes like age, gender, and addresses. Appendix 12.7.1 shows the base we had for the addresses before we randomized. Inspired by Bertrand and Mullainathan's study, we decided that all identities had to be within the same range to avoid age discrimination or an identity seeming too young for the experience they possess. SSB reports that the age group between 30-40 experiences the least amount of age discrimination (Oppøyen, 2022). Consequently, we have given all the fictitious identities an age within the early thirties, 30-35, and randomized within this range. Since these ages gave all our identities birth years in the 1980's, we collected names from statistics based on birth certificates from the same period in our experiment.

In our experiment, we have a collection of 50 Pakistani applicants and 50 Norwegian applicants, where 25 are male and 25 are female. Every applicant is assigned a randomly given name based on the statistical sample we found (SSB, n.d.). Furthermore, SSB has a collection of the 100 most popular Norwegian surnames from 2013, and our randomization of 50 Norwegian surnames is based on this sample (SSB, 2013). The different lists of names can be found in the appendix under 12.6. The same process was also followed for a collection of Pakistani



applicants. The only difference, in this case, was that we could not find a source on the most popular Pakistani names in the 1980's. For that reason, we have gathered Pakistani names and surnames based on the most recent statistics. The most common names in Pakistan are traditional Arabic-Abrahamic (Quranic, Biblical Arabic, and Judaic Arabic) (Evason, et al., 2016), and thus we believe that naming conventions have not differed remarkably over the course of the past 30-35 years.

The gender of these 200 applicants is required to reflect gender distributions in the insurance sector in Norway to mirror a real hiring process. Therefore, we decided to base our gender distribution on SSB statistics in 2022, which indicated that 53% of the employees in the insurance sector are men and 47% of the employees are women (SSB, 2022). Based on these statistics, it is reasonable to have a balanced gender distribution. We randomized the proportions of genders in each hiring process while, as mentioned above, ensuring an equal distribution of males and females in total. Given that we were also interested in seeing if the gender of the applicant affects the participant's decision, we believed that randomizing the variable would be the best way to pick up on any possible effect.

## 5.0 Experimental Assumptions

In regard to our experiment, we have formulated assumptions about which conditions are necessary to categorize a result as valid. These assumptions ensure that conditions are consistent each time a volunteer's choice is registered and that the totality of results can be used to create statistical models in the explanation of our study. Furthermore, there is no guarantee that our assumptions are correct, but they contribute to the experiments being conducted consistently.

One of our main assumptions is that our target group has a high chance of becoming potential future leaders in the labor market. When we looked into the job postings within leadership roles, most of them required a bachelor's or a master's degree in economics, administration, and/or leadership. Therefore, we assumed that students enrolled in these types of bachelors would fit into our definition of "our future leaders."

Our second assumption is that the physical outline and design of the experiment prompt system 1 thinking in our test subjects. Since the test subjects will only have a small amount of time, they would not have the time to go over to a system 2 thinking process. The psychologist Daniel Kahneman refers to systems 1 and 2 in his book "Thinking Fast and Slow" as different ways the human mind processes situations it encounters. System 1 operates fast and automatically,

without effort. System 2 demands attention and is needed to comprehend complex situations (Kahneman, 2016, page 22).

Our third and final assumption is that our test subjects are not aware of what we are experimenting on. All they know is that they are supposed to recruit one of the four CVs for a call back with the company they are “employed” at. Given that we have a small variation in the different characteristics and skills of the CVs, the idea is that our test subject will not suspect the main focus to be on racial bias.

## 6.0 Recruitment Process and the Execution of the Experiment

In order to get the maximum statistical power with our limited resources, we found that we would need 100 first-year students and 100 third-year students. Given that we needed a total of 200 participants, we tried to make use of as many recruitment channels as possible. Our recruitment text was distributed through several Facebook groups, as well as teachers who volunteered to post it in different groups on the student platform Canvas. We also posted flyers on the information boards at the Campuses. Our main recruitment source, however, was through actively going around on the Campuses and inviting people to participate.

As mentioned, our target group is students who have the prospect of becoming our future leaders. We have further classified the potential future leaders as those who study economics, marketing, management, and in general bachelor’s within leadership and/or administration. Because of this, we plan to reserve rooms near our target group’s auditoriums. The rooms are small and have little-to-no hallway disturbance, so as not to distract the test subjects. Our idea is for it to resemble an office, with one desk and one chair. The test subjects will enter the room one by one and be faced with a consent form (including a sheet with extra information about the experiment found in Appendix 12.3), a short case description, and a set of four fictitious job applications (Appendix 12.4). Every test subject will have a maximum of 5 minutes inside the room. For many, this may be too much time, but we want to make sure that there will be enough time left over for any possible problems that may occur – or quite simply, a slow reader.

Our experiment is to be executed on school grounds, and the plan is to be stationed at HVL Campus Bergen for an entire week. The first three days in the main building, K1, where most first-year students have lectures. The following two days in K2, where many third-year students both study and have lectures. In case of a shortage of test subjects, we will then move on to BI Campus Bergen and continue the experiment there.

During the experiment, one person in our group will be right outside the room. This person will monitor the time, collect the consent forms and the answer sheets, and answer any questions the test subject may have. We will have one person who continues to randomize our collection of CVs and pair a set of CVs up with a consent form and a question form. This way we will have a flow that ensures that we do not run out while the experiment is in progress. The reason behind doing it this way is that we only have one copy of each CV, and we have to make sure that the execution of the randomization is done correctly. Once the test subjects have handed in their forms, we will kindly ask them to leave the area to make sure that they do not come in contact with the other participants.

## 6.1 In the Field

On the first day, Monday the 20<sup>th</sup> of March, we were stationed on B108 and B110 at HVL. These two rooms were close to the main entrance and right next to the first-year students' auditorium. We were then able to recruit people when they had a break in their lectures, and in total, we had 58 people who participated that day. On Tuesday the 21<sup>st</sup> of March we were stationed in the same rooms, but we changed our strategy. We noticed that the people who came out of the classrooms were mostly the same ones who participated the day before. Because of this, we tried a more mobile strategy and went around to different people studying on campus. By applying this strategy, we got a total of 42 participants that day.

Not only did we see a physical decrease in the number of people we recruited, but there were also more times when we were not able to recruit, and we found that it took more effort to get people to participate on the second day. For this reason, we decided to deviate from our original plan and go to BI on Wednesday the 22<sup>nd</sup> of March. Most of the students at BI study something within management/leadership, and we would then be able to broaden our recruitment pool. This turned out to be a smart decision, as we got a total of 100 people within only three hours at their campus.

## 7.0 Experimental Results

The following section presents the findings of the conducted experiment, which have been categorized into five distinct segments. The first segment of the experiment contains the outcome of the main research question: "*Do future leaders hold racial bias?*". The experiment comprises three additional parts that offer different viewpoints on the main research question. We will analyze the data using statistical calculations that are based on hypothesis testing

methods to draw reliable conclusions. Lastly, the fifth segment will feature a regression analysis of the factors in the previous segments.

### 7.1 Segment 1: Do Future Leaders Hold Racial Bias?

The experiment yielded a total of 200 observations. The visual representation on the right indicates that 51% of the population opted for CVs with Pakistani names, while the remaining 49% preferred Norwegian names. Consequently, the distribution of observations is 102 and 98, respectively. Despite the seemingly insignificant difference between the two proportions, we find it important to examine the outcome using statistical tools for more dependable conclusions. To test the hypothesis, we have opted to conduct a z-test.

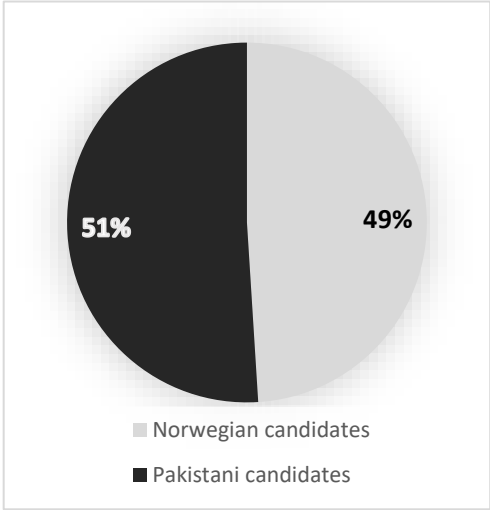


Figure 1: Distribution of our observations.

The choice to use a z-test in this experiment is appropriate as it is designed to test the significance of the difference between two proportions. While the z-test assumes that the standard deviation of the population is known, we can still justify the use of the z-test by appealing to its asymptotic properties, which states that for a sample size larger than 30, the z-test and T-test will produce identical results. In addition, the assumption that the data should follow a normal distribution is justified by appealing to the central limit theorem. Therefore, we can calculate the z-value and the corresponding p-value to determine whether the observed 2% difference is statistically significant or merely due to chance.

The hypothesis:

- **H<sub>0</sub>**:  $P_{\text{Pakistani}} = 0.5$  à *The selection of CVs does not vary based on whether the candidate's name is Pakistani or Norwegian.*
- **H<sub>1</sub>**:  $P_{\text{Pakistani}} \neq 0.5$  à *The selection of CVs does vary based on whether the candidate's name is Pakistani or Norwegian.*

To calculate the z-score we can use the following formula:

$$z = \frac{(p - P)}{\sqrt{\frac{P(1 - P)}{n}}}$$

- Where “p” is the sample proportion, “P” is the hypothesized proportion (0.5 in this case), and “n” is the sample size.

For the Pakistani names, we have  $p = 102/200 = 0.51$ . Plugging these values into the formula, we get  $z = 0.282$ . Using a z-table or a calculator, we can find that the p-value associated with this z-score is approximately 0.777. This means that if the null hypothesis was true, we would expect to see a sample proportion as extreme as, or more than, 0.51, about 77,7% of the time.

Since the p-value (0.777) is greater than the significance level of 0.05, we fail to reject the null hypothesis. We can conclude that there is not enough evidence to suggest that the selection of CVs varies based on whether the candidate's name is Pakistani or Norwegian. However, it is possible that such variations may exist.

## 7.2 Segment 2: Is there a Relationship Between Years of Study and a Possible Racial Bias?

This segment of the analysis aims to determine whether educational studies facilitate the prevention, promotion or have no effect on racial bias among students enrolled in leadership courses. The diagram depicted below illustrates the findings derived from the conducted experiment.

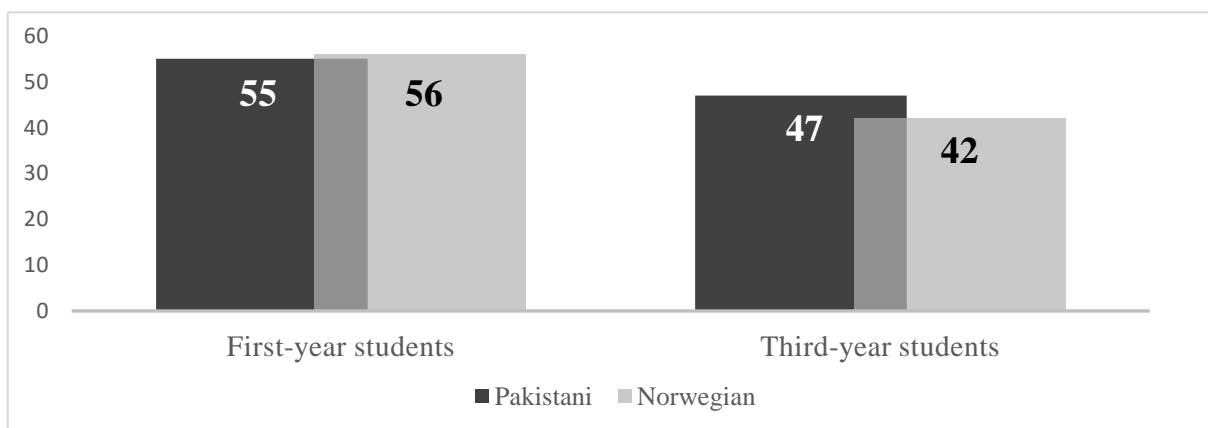


Figure 2: Distribution between first- and third-year students.

Further, the data from the figure above will be subjected to two distinct z-tests – the first being conducted on first-year students and the second being conducted on third-year students. This is in order to ascertain the presence or absence of any variations in racial bias between the two groups. The z-test employed in this context will utilize the same method as the preceding test.

First year students:

- $H_0: P_{\text{Norwegian}} = 0.5$  à There is no difference in racial bias among first-year students

-  $H_1: P_{\text{Norwegian}} \neq 0.5$  à *There is a difference in racial bias among first-year students*

We looked into how many first-year students selected Norwegian names and found that out of 111 students, 56 chose Norwegian names, which translates to a proportion of 50.45%. By utilizing the previously mentioned z-test formula, we determined a z-score of 0.0949. After consulting a z-table, the associated p-value was found to be approximately 0.942. This would indicate that if the null hypothesis was true, we would expect to observe a sample proportion of first-year students selecting Norwegian names as extreme as 0.5045 about 94.2% of the time. Since the p-value (0.942) is greater than the significance level of 0.05, we fail to reject the null hypothesis ( $H_0$ ). In other words, the data does not provide enough evidence to suggest that the observed difference in the proportion of Norwegian names is statistically significant, and thereby we cannot conclude that there is a difference in racial bias among first-year students.

Third year students:

-  $H_0: P_{\text{Norwegian}} = 0.5$  à *There is no difference in racial bias among third-year students*

-  $H_1: P_{\text{Norwegian}} \neq 0.5$  à *There is a difference in racial bias among third-year students*

Conducting the same method as earlier, a proportion of 0.4719 (42/89) was obtained. Plugging these values into the z-test formula yielded a z-score of -0.53 and a corresponding p-value of approximately 0.596. Using the same approach as before, this would show that if the null hypothesis were true, we would expect to observe a sample proportion of a third-year student selecting Norwegian names as extreme as 0.4719 about 59.6% of the time. Since the p-value (0.596) is greater than the significance level of 0.05, we fail to reject the null hypothesis ( $H_0$ ). In other words, the data does not provide enough evidence to suggest that the observed difference in the proportion of Pakistani names is statistically significant. Thus, we cannot conclude that there is a difference in racial bias among third-year students either.

### 7.3 Segment 3: Racial Bias & Schools

In this segment, we will find out if there is a discernible contrast in the level of racial bias among students attending private versus governmental schools in Norway. To explore this possibility, we will employ a statistical testing method known as the "chi-square test". The chi-square test is a statistical technique that is commonly used to examine the relationship between categorical variables. Categorical data, which is characterized by qualitative traits rather than numerical values, can be divided into distinct groups or categories. For instance, in our experiment, the designations "HVL – Pakistani", "HVL – Norwegian", "BI – Pakistani", and

"BI – Norwegian" exemplify categorical data due to their representation of distinct groups based on ethnicity and school types.

	HVL		BI	
	Pakistani	Norwegian	Pakistani	Norwegian
Observed values	55	45	53	47
Expected values	50	50	50	50

Table 1: Observed vs. Expected values at the universities.

- $H_0: p = 0.5$  à *There is no correlation between race and school type regarding the likelihood of receiving a job interview invitation.*
- $H_1: p \neq 0.5$  à *There is a correlation between race and school type regarding the likelihood of receiving a job interview invitation.*

To calculate the chi-square value, we can use the formula:

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

- Where  $O_i$  = observed frequency, and  $E_i$  = expected frequency

Upon plugging in the numbers from the contingency table, we obtain a chi-square value of  $\chi^2 = 1.36$ . To determine the statistical significance of this chi-square value, it is necessary to compare it with the critical value obtained from the chi-square distribution with degrees of freedom equivalent to (number of rows - 1) x (number of columns - 1), which in this case is (2-1) x (4-1) = 3. Using a significance level of 0.05, the critical value is calculated to be 7.815. The statistical analysis of the data reveals that the calculated chi-square value (1.36) is less than the critical value (7.815), thereby leading to the failure of rejecting the null hypothesis. This means that there is no evidence to conclude if there is a correlation between race and school type or not.

### 7.4 Segment 4: Gender & Racial Bias

The research question examined in this segment pertains to the potential influence of gender and ethnicity, as indicated by having a Pakistani or a Norwegian name, on the probability of being invited for a job interview. To examine this sub-topic, the first step involves administering a broad chi-square test to simultaneously evaluate all categories in a similar manner as described

previously. This includes creating a table to input the observed and expected values first, followed by setting up the hypothesis.

	Norwegian		Pakistani	
	Women	Men	Women	Men
Observed values	58	40	67	35
Expected values	50	50	50	50

Table 2: Observed vs. Expected values between the two nationalities and genders.

-  $H_0: p = 0.5$  à *There is no correlation between gender and race regarding the likelihood of receiving a job interview invitation.*

-  $H_1: p \neq 0.5$  à *There is a correlation between gender and race regarding the likelihood of receiving a job interview invitation.*

Utilizing the same chi-square test formula as above, we obtain a value of  $\chi^2 = 13.56$ . We then determine the critical value from the chi-square distribution with 3 degrees of freedom, resulting in a critical value of 7.815 at a significance level of 0.5. Since our calculated chi-square value (13.56) is greater than the critical value (7.815), we can reject the null hypothesis. Thus, we can conclude that there is a statistically significant difference between the observed and expected frequencies, indicating the presence of a racial bias. In other terms, there might exist a correlation between gender and race regarding the likelihood of receiving a job interview invitation.

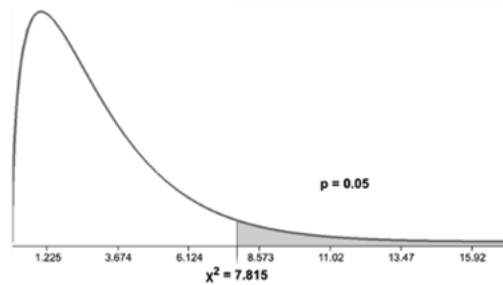


Figure 3: This figure illustrates a chi-square distribution, in which we cannot reject  $H_0$  if the chi-square value falls into the grey scarved area.

Additional further testing is necessary to identify which ethnic groups experience racial bias based on gender. To accomplish this, two distinct tests will be conducted. The first test will involve examining the gender distribution of the CVs selected with Norwegian names, while the second test will be conducted on CVs selected with Pakistani names. By performing these tests, we can gain a more comprehensive understanding of the relationship between race, gender, and biases in the job interview process.

#### 7.4.1 Norwegian Names & Gender

-  $H_0: p = 0.5$  à *There is no correlation between gender and Norwegian race regarding the likelihood of receiving a job interview invitation.*



-  $H_1: p \neq 0.5$  à *There is a correlation between gender and Norwegian race regarding the likelihood of receiving a job interview invitation.*

Assuming that there is no discernible difference in the selection of genders, an even distribution of 49 men and 49 women would be expected. However, empirical data reveals that the number of Norwegian men is 40, while the number of Norwegian women is 58. Calculations based on these numbers:

- $X \sim \text{Binomial}(98, 0.5)$
- In excel we found:  $P(X \leq 40) = 0.042$ ,  $P(X \geq 58) = 1 - P(X \leq 57) = 0.042$
- *Criteria: reject  $H_0$  if  $P(X \leq 40) \leq 0.025$  and  $P(X \geq 58) \leq 0.025$*

The critical value for the statistical test given is 0.05. The calculated value of 0.042 is found to be lower than the critical value. Based on this finding, the null hypothesis cannot be rejected. Hence, there is insufficient evidence to suggest that the probability of selecting Norwegian men is significantly different from 0.5. In other terms, we cannot conclude that there is no correlation between gender and Norwegian race regarding the likelihood of receiving a job interview invitation.

#### 7.4.2 Pakistani Names & Gender

-  $H_0: p = 0.5$  à *There is no correlation between gender and Pakistani race regarding the likelihood of receiving a job interview invitation.*

-  $H_1: p \neq 0.5$  à *There is a correlation between gender and Pakistani race regarding the likelihood of receiving a job interview invitation.*

In the case of the Pakistani race, we would anticipate an equal count of 51 individuals for each gender, given that no significant disparity exists in gender selection. Nonetheless, the actual observed number of Pakistani men is 35, while the number of Pakistani women is 67. Calculations based on these numbers:

- $X \sim \text{Binomial}(102, 0.5)$
- In excel we find:  $P(X \leq 35) = 0.0009$ ,  $P(X \geq 67) = 1 - P(X \leq 66) = 0.0009$
- *Criteria: reject  $H_0$  if  $P(X \leq 35) \leq 0.025$  and  $P(X \geq 67) \leq 0.025$*

Based on the statistical analysis, it can be inferred that this time the null hypothesis can be rejected as the calculated value of 0.0009 is lower than the critical value of 0.025. This indicates that the probability of selecting Pakistani men is significantly different from the assumed value

of 0.5. Therefore, it can be concluded that there might be a correlation between gender and the Pakistani race regarding the probability of receiving a job interview invitation.

To briefly summarize, the two sections above aimed to investigate whether the difference between the selected genders was significant enough to suggest that men encounter more racial bias than women – seeing as the selection of men was lower than that of women. For the Norwegian race, there wasn't a significant difference between Norwegian men (40) and Norwegian women (58) to conclude gender bias. However, for the Pakistani race, the difference between the selected number of men (35) and women (67) was significant enough to suggest that Pakistani men encounter more gender bias than Pakistani women. Our findings indicated that Pakistani women are approximately 16.2% more likely to receive a job interview invitation than Pakistani men. However, it is important to note that this percentage is based solely on the sample data collected and may not necessarily reflect the same trend in the overall population.

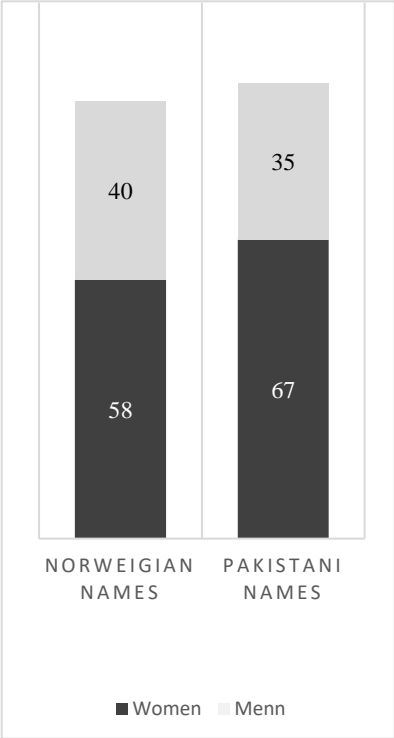


Figure 4: The figure depicts the distribution of gender selection among individuals of Pakistani and Norwegian race, as based on the observed data.

### 7.5 Segment 5: Regression Analysis

In addition to conducting several hypothesis tests, we performed a regression analysis to investigate the factors that may have influenced the decision to choose a CV with a Pakistani name. Regression analysis is a statistical method used to determine the relationship between the dependent and independent variable(s). It allows for an evaluation of the strength and direction of the relationship between variables, as well as proving a measure of the magnitude of the effect of each independent variable on the dependent variable. While hypothesis tests, such as z-tests and chi-square-tests, can identify the statistical significance of a variable, a regression analysis is necessary to determine the magnitude of the variation that currently remains unknown. This is particularly important as it allows for the estimation of the individual effects of each independent variable on the dependent variable, controlling for the effects of the other independent variables in the model.

Our regression model in Excel includes three predictor variables: the grade level of the individual (X1) – either first- or third-year students –, the individual's gender (X2) – male or

female –, and the school the individual attended (X3) – private or governmental school. Moreover, the model includes three additional “interactional terms” combining all three variables. We can notice that in this analysis, a previously untested variable has been incorporated, specifically the potential influence of the participant’s gender on the outcome. As all these variables cannot be measured using quantitative values, they were categorized as dummy variables. The main objective of this analysis is to assess how effectively these three explanatory variables can account for the variation observed in the outcome variable Y, which in this context is whether a person chooses a candidate with a Pakistani name, rather than a candidate with a Norwegian name.

Firstly, it is important to mention the obtained value of the R-square. The R-squared value is a statistical measure that indicates the proportion of variance in the outcome variable (Y) that can be explained by the predictor variables (X) and interactional terms included in the model. For our model, the R-squared value of 0.0302 indicates that only 3.02% of the variation in the outcome variable (the decision to choose a CV with a Pakistani name) is explained by the three predictor variables included in the regression model. In this case, a low R-squared value suggests that the model is most probably not capturing all the relevant factors that are affecting the outcome variable. It is imperative to note that the exclusion of potentially influential variables from our analysis was not a decision taken lightly. The limitations in resources and timeframe, led by our own limited expertise, necessitated the selection of a few easily measurable variables. Despite recognizing the possible impact of other factors such as an individual’s age, ethnicity, socio-economic status, prior experiences with discrimination, and political and religious affiliations, it was necessary to prioritize the available resources to maximize the quality of our study. Therefore, the resulting R-squared value was not unexpected given the constraints and limitations under which the study was conducted.

The model produced an equation as follows:

$$\hat{Y} = 0,34 + 0,16x_1 + 0,14x_2 + 0,27x_3 - 0,17x_1x_2 - 0,21x_1x_3 - 0,16x_2x_3 + e$$

The equation provides us with coefficients for each independent variable indicating the power and direction of their relationship with the dependent variable. The results indicate that if all independent variables are equal to zero, the intercept term (0.34) represents the baseline probability of choosing a CV with a Pakistani name, which is 34%. Furthermore, being a first-year student gives 16% more probability to select a CV with a Pakistani name compared to a Norwegian name. Similarly, being a male participant exhibits a 14% greater likelihood of

choosing a CV with a Pakistani name, and students from HVL (a governmental school) are 27% more inclined to select a CV with a Pakistani name. Also, we got negative coefficients on all three interaction terms suggesting that being a first-year male student, a male student at HVL, and a first-year HVL student gives less likelihood to select a CV with a Pakistani name compared to a Norwegian name, with percentages of 17%, 21%, and 16% respectively. It is important to note that each interpretation has been adjusted for the effects of the other variables in the model, which allows us to isolate the specific impact of each predictor on the likelihood of choosing a CV with a Pakistani name.

However, it is important to note that despite the reported results, the p-values for the coefficients of the independent variables and interaction terms, except for one variable, were all found to be much higher than the significance level of 5%. The sole exception was the type of school attended by the individual (represented by X3), with a p-value of 3.2%, indicating statistical significance at the 5% level. This implies that the school attended by an individual, whether governmental or private, exerts a notable influence on their tendency to choose a CV featuring a Pakistani name over one bearing a Norwegian name while controlling for other independent variables. Notably, the earlier conducted chi-square test produced a dissimilar conclusion. This discrepancy is not surprising, as both tests operate on distinct assumptions and regulations. The chi-square test, for instance, is limited in its ability to account for the effects of multiple variables, as it examines only the relationship between two categorical variables. In contrast, the regression model incorporates multiple independent variables and their interaction effects.

The elevated p-values for the two remaining coefficients, namely the participant's gender and grade, indicate that any detected variances in CV selection are likely due to chance rather than a real effect. This finding supports the results of the hypothesis tests carried out earlier. While this implies that the evidence is inadequate, it does not necessarily mean that the observed differences are entirely due to chance or random variability in the data. Further studies featuring expanded and more heterogeneous sample sizes may be necessary to offer a more definitive conclusion.

## 8.0 Experimental Errors

In the following section, we are to discuss errors that may have influenced our experiment's results. We categorize errors as situations where there are forces present which could cause variations in the results to such an extent that the results are made invalid. The errors are mainly caused by humans, systems/design, and random factors. In this section, we will discuss errors

that may have been transmitted from Bertrand & Mullainathan's study, since we have based our experiment on theirs. In addition to this, we address errors that have appeared through transforming Bertrand & Mullainathan's experiment into our setting, as well as errors that we encountered while executing the experiment.

Bertrand & Mullainathan mainly discuss the weaknesses of their experiment relative to previous audit studies (Bertrand & Mullainathan, 2004, page 9). However, a weakness they mention that may have been transmitted to our experiment is how race is interpreted through CVs. Bertrand & Mullainathan mention that in their case, the résumés do not directly reflect race but instead suggest race through names (Bertrand & Mullainathan, 2004, page 9). In our experiment, the name on the CV may not have reflected race well enough to suggest that the volunteer's choice of CV was based on the applicant's racial background. This may, similar to Bertrand & Mullainathan's study, underestimate the extent of discrimination (Bertrand & Mullainathan, 2004, page 9).

In the execution of our experiment, we faced some challenges with a couple of volunteers which can be viewed as possible errors. An example of this is that one volunteer openly suspected the true intention of the experiment. This did not contaminate the results of others since there were no other volunteers present in the area, and since it also happened at the very end of our experiment at HVL. However, we still consider this a possible error as others may also have identified the true intention of the experiment but not openly spoken about it. The result of the mentioned volunteer was obviously discarded.

Volunteers being able to identify the purpose of the experiment was one of our main concerns. Compared to Bertrand and Mullainathan's study, the demand effects in our experimental design were higher. Our design is more "see-through", and it would have been easier for the test subjects to understand what we were looking for. The possibility here is that our test subjects could have responded how they think we would expect or want them to.

Through the design of the experiment, we identified several factors with our experimental design that could cause the volunteer to understand our intention. One of which was the number of CVs that were presented to the volunteers. A high number of CVs, for instance six, could confuse the test subject as there would be many factors for them to compare in the limited amount of time given. In practice, it would also be more work to execute the experiment with six CVs in one set. Therefore, we decided to use four CVs in each set - to balance out these

effects. A lower number of CVs, for instance two, would make it easier for the test subject to compare the two and draw out the differences between them.

An alternative design for our experiment could be to use one randomized CV per test subject. The participants would then have to determine whether or not the applicant is qualified for the open job position. The positive aspect of this type of design is that it would be harder for the participant to realize the intent of our experiment, therefore making our design less “see-through”. However, a probable outcome of this alternative design is that most, or all the participants would then recommend the applicant. A possible reason for this is that the participants would not have another CV to compare the applicant to, in addition to the CVs being of a high standard (and all applicants being qualified for the position). Thus, we would be unable to conclude that there exists a prejudice against Pakistanis. Because of this, we found that our experimental design would give a more conclusive outlook on the presence or absence of racial bias within our chosen target group – despite the heightened chance of a more “see-through” design.

Another factor we considered was that the proportions of Norwegian and Pakistani names for each volunteer could contribute to exposing our intent. We used a 50/50 distribution of Norwegian and Pakistani names in our experiment, similar to the distribution of fictional résumés sent to each job opening in Bertrand & Mullainathan’s study. Since we expose our volunteers to four CVs and the presence of a Pakistani name was necessary to conduct the experiment, we believed that the effect of having an equal distribution would contribute less to highlighting our intent than for example a 75/25 distribution.

There were also concerns that the participant’s impression of the experiment’s realism could have contributed to the volunteer randomly picking a CV, thus creating an error. This could be caused by using CVs instead of a letter of application, as CVs give less depth to a person’s character than a letter of application. The limited time the volunteers had could also have contributed to random selection. In addition to this, there was no risk involved for the participant in choosing a CV, which would be present in a real-life situation as recruiting new employees should be viewed as a “million-dollar contract” (Heggholmen, 2014, page 85). We believe that the level of realism used in our experiment was sufficient to uncover a possible racial bias as the CVs were simplified to fit the time given to the participants. However, we cannot guarantee that the volunteer picked a CV at random over choosing the candidate they considered as best for the position.

Through our experiment we used random selection and self-selection as methods for picking volunteers. For each of these methods follow weaknesses. Self-selection gives little control over who participated in the experiment, and there is also no way of knowing who chose not to participate (Grønmo, 2016, page 116). Random selection requires the selection options representing the whole population to be addressed as random. We picked random students that were present on the day we conducted the experiment, but they might not represent the whole population of students in economic studies in Norway.

Another argument on why our test subjects may not be an accurate reflection of the whole population in Norway is that we only conducted our experiment on two universities in Bergen. Many Norwegians live in the countryside, or smaller cities, which could suggest that our target group only represents students studying in the bigger cities. However, seeing as some of the most desired economic and leadership studies are mainly found in the cities, we believe that the two campuses reflect the universe well enough to draw a representative conclusion.

In our case, the students we asked had to agree to participate in the study. Since three out of four in our bachelor's group have a background from a non-western country (Morocco, Pakistan, and Turkey), we may have failed to gain participants holding a racial bias as they may avoid participation. This may have resulted in the "random selection" of people who do not represent the average economics student. This is further strengthened by us knowing we gained the vast majority of participants for the study through «random selection», and that we did not have control over who chose not to volunteer through the Facebook and Canvas announcements.

## 9.0 Discussion

In this section, we will reflect on how our experimental results can be explained through the previously mentioned theory. The presence or absence of racial bias in the different segments of the result will be discussed in light of literature, theory, and other studies we have gone over throughout this thesis.

When we compare our experiment to the related studies which we drew inspiration from, we see a number of differences that may have contributed to our results. In contrast to our experiment, the results in Bertrand and Mullainathan's study showed that there was an existing racial bias in the US labor market. It's important to note that their study was conducted in the United States on Black Americans, whereas our experiment was based on Norwegian Pakistanis. Discrimination against these two groups differs in terms of their historical, cultural,

legal, and societal foundations. The discrimination against Black Americans is rooted in the legacy of slavery, systemic racism, and a history of segregation in the United States. On the other hand, discrimination against Pakistani individuals often stems from stereotypes and prejudices associated with religion and cultural practices, such as assumptions about their perceived "backwardness" or association with terrorism (Yousaf, 2017). Furthermore, the social norms related to discrimination also vary between the two countries. The United States seems to generally have a history of overt racial discrimination, while Norway's biases are often more subtle and implicit. Given the distinct discrimination foundation between Black Americans and Pakistani individuals, it is therefore reasonable that our results varied from Bertrand and Mullainathan's study.

Another major difference between our experiment and Bertrand & Mullainathan's is that we conducted ours almost two decades after they published their paper. One could argue that this amount of time has caused a change in the mindset of many people when it comes to race and treating people equally. In today's society, there are several measures that have resulted in this positive development. An example of this is how invested young people have been in promoting change, through causes like Black Lives Matter, the fight for abortion rights, etc. The fact that we were unable to conclude that there exists a racial bias can be a cause of these types of movements. A previously mentioned study that supports our results, is a report from SSB which showed a positive view on the integration of immigrants. This report came out in 2019, which can indicate that our result may be a more accurate measure of how Pakistani immigrants are treated in Norway, than a US study executed in 2004. Furthermore, a large part of the people who expressed this positive outlook on immigration were young people. Given that our study was based on young university students, we may have tested our thesis on a group of people who were more open-minded to the integration of immigrants and less exposed to prejudice and biases held by older generations.

An opposing argument to our concluding result may be that the participants picked a CV randomly. If there does exist a racial bias, a random selection could explain why our result differs from the mentioned related studies. This suspicion is further strengthened by the almost equal distribution of the results in segments 1-3. A random selection would cause an equal or close to equal distribution of races, as our results show. Our experimental design gave the CVs similar qualifications, skills, and personalities. The CVs were purposely designed to be hard to distinguish from each other in order to isolate the name as the main variable. However, this design may have caused the volunteer to consider all the CVs equally qualified for the fictional



job opening and therefore picked one at random. Another reason as to why this might have happened is the limited time given to each participant. An approximate 5 minutes may not have given them enough time to get a full overview of the applicant's qualifications. If a random selection was present, it would cause the discrimination effect to disappear as well as any effect the educational system may have on discrimination.

Leadership and management subjects in universities are constantly changing in tune with the social climate. In today's classes, there is a larger focus on workplace culture and the dynamics between coworkers. These leadership classes teach students that having an inclusive environment at work is important and that it could contribute to better and more motivated employees. As mentioned, the data in Segment 2 did not provide enough material for us to conclude that there exists racial bias among first- and third-year students. This could mean that the increased focus on a healthy and inclusive work environment has contributed to students being less racially biased. A counterargument to our results could be that university students may be seen as inexperienced when it comes to recruitment, in that they might not understand the risks of faulty recruitment. This level of inexperience could imply that our target group could not see the consequences of who they hired, and how it would affect the workplace culture. However, seeing as most students in Norway today have a part-time job alongside their studies, they are more exposed to the labor market and have a better understanding of what affects the workplace environment.

Under segment 3 there is as mentioned a contradiction between the results of our chi-square test and the results from our regression analysis, which means that we are unable to draw a definite conclusion on the racial bias in private versus governmental schools. However, there are certain elements that could explain both sides.

The difference in quality between private schools and government schools in Norway is less evident compared to many other countries. In countries such as Pakistan, the government school buildings are more run-down than the schools in the private sector. A possible reason for this disparity could be attributed to the difference in the funding allocated to these schools. In addition to this, the quality of studies and teachers in other nations is higher at private schools (Awais, 2021; Farooq, 2017). Teachers usually get lower pay at governmental schools, which could contribute to them not caring as much for the quality of what they teach. A core problem behind these differences in quality between governmental and private schools in other countries can therefore be a lack of money. Given that Norway is a wealthy state, more money is assigned to governmental schools to ensure that all students have an equal opportunity to achieve a high-

quality education (Christensen, 2022). This is a possible explanation for our chi-square test showing no difference in racial bias comparing results from the two institutions.

In general, public universities such as HVL tend to have more diverse student populations compared to private institutions like BI. This is due to public universities being more affordable and accessible to students from a wider range of socio-economic backgrounds. Public universities also tend to have a larger geographic reach, which attracts students from more diverse regions. For instance, public universities are located both in the countryside and in cities, while private universities focus their attention on the larger cities in the country. Conversely, private institutions may have higher tuition fees and a more selective admission process, which can limit the diversity of their student body. HVL students may come from more diverse racial and ethnic backgrounds and have more varied cultural and linguistic experiences than BI students, which could contribute to a greater likelihood of less racial bias. Additionally, the lack of exposure to diverse cultures among BI students may further reinforce and perpetuate biased attitudes. This on the other hand may help to explain why in our regression analysis, HVL students were 27% more likely to select a Pakistani applicant compared to BI students.

Experimenter demand effects may also be a possible contributor to our results showing no significant difference between racial bias and university students, the two universities, and the different grade levels. These demand effects cover behavioral changes in our test subjects as a result of what can be seen as appropriate behavior (Zizzo, 2009). As mentioned, we designed the CVs to make the name of the applicant stand out. This could have contributed to a more “see-through” design, as it would make it easier for the participants to spot the difference between the CVs. If we had opted for more variety in the CVs, we may have been able to minimize the chance of this error. It is plausible that if some participants realized the true intent of our experiment, they may have favored the Pakistani applicant on the basis of wanting improvement and positive development in the labor market. During the experiment, we had several participants who were foreign. Some of these people may have been Muslim or come from regions where the names on the CVs are common or where they speak the language listed under skills. This factor could have caused the foreign participants to feel a sort of connection to the Pakistani applicants, and to feel inclined to choose a Pakistani name. This type of positive bias can be classified as experimenter demand effects.

Another way these demand effects may have contributed to our results is through negative biases toward Pakistanis. Our result in segment 4 showed that there is a significant difference in recruitment between Pakistani men and Pakistani women, which could indicate that the men

come across more bias than the women. A mentioned Norwegian study by SSB supports these findings. Here they found that there is a higher rate of discrimination against Pakistani men, with a reported discrimination rate of 25%, whereas our results show a result of 16,2%.

As mentioned, the first Pakistanis who arrived in Norway in the mid-1960s were men. In Norway, these men filled jobs that were traditionally not desired by Norwegians. The increasing level of immigrants in this period lead to a growth in racism against Pakistanis (as well as other racial groups), to such an extent that the Norwegian government stopped immigration in 1975. It is likely that a possible later association with Pakistani men was that they are of a lower class and cannot be trusted with “higher leveled” jobs. These types of associations may be a result of Pakistanis coming from a country with high corruption and crime, and it is therefore not difficult to understand that Norwegians found it hard to trust Pakistanis – more specifically Pakistani men. In addition to this, there are also negative associations toward men connected with social standing in Islamic countries, such as Pakistan. Through social media, many are aware of the governmental sanctions upon women’s rights. These include women, until recently, not having the right to drive a car in Saudi Arabia, or them facing violence and serious restraints on freedom of speech in Iran. Such assumptions are pushed by the news, and they create a generally negative outlook on Pakistani men. For this reason, employers may have a negative bias toward Pakistani men, possibly rooted in fear or anger, which support our findings.

## 10.0 Conclusion

Racial bias in recruitment processes is a pressing issue that affects individuals from diverse backgrounds and has a significant impact on both their personal well-being and society as a whole. As pointed out, racial bias in society leads to valuable resources, talent, and potential labor going to waste as it excludes people based on unfair factors such as skin color, religion, clothing, and language. In countries like Norway, which pride themselves on inclusive communities that promote dialogue, freedom of speech, and diversity, racial bias threatens the country's values, morals, and overall development. The presence of such bias is detrimental to all aspects of society, from the individual to the national level. Therefore, it is imperative to address and eliminate racial bias in recruitment processes for the betterment of society as a whole.

To contribute to insights into present racial bias in the hiring process, our lab experiment sought to conduct a study on university students pursuing leadership bachelor's programs. Through this study, we anticipated the results could guide future recruitment processes. Additionally, we

aimed for the study to possibly provide valuable insights to the Norwegian society and government about the effectiveness of their efforts and measures in the education system so far. Provided with this knowledge, stakeholders can make informed decisions and develop more accurate and rational plans for addressing the issue in the future.

Our primary research question, upon which all subtopics were based, was whether future leaders hold racial bias. In summary, our findings indicate that there is no evidence to suggest that future leaders hold such biases. We also observed no significant statistical difference in racial bias between first- and third-year students. Furthermore, our experimental protocol allowed us to examine several other variables while still in the experimenting process, such as whether private or governmental institutions had any impact on the likelihood of receiving a job interview invitation, whether female and male participants differed in their choices, and whether participants demonstrated any gender discrimination toward Pakistani and Norwegian applicants. In regard to different institute types, we arrived at two conflicting conclusions, rendering an inconclusive answer. Conversely, gender did not appear to play a significant role in the applicant selection. Finally, we identified one statistically significant variable: the applicant's gender. Our findings demonstrated that Pakistani women were significantly more favored than Pakistani men, indicating gender bias in the recruitment process. In contrast, we did not observe any gender discrimination among the Norwegian participants.

As we have discussed, one possible explanation for our results is the changing social climate in Norway, particularly among younger generations. With an increased focus on workplace culture and inclusivity in leadership and management subjects, students may be more aware of the importance of diversity and less likely to exhibit racial bias. Moreover, Norway being a small and affluent country, there is little difference between governmental and private schools. A large number of students, whether they are first- or third-year students, are provided with opportunities to participate in various sectors of the labor market, which exposes them to a workplace and inclusive community exercise. We believe that these factors have also influenced our results by not showing any significant difference in racial bias among the students. However, gender discrimination observed in our study was seemingly significant and only applied to Pakistani applicants. As discussed earlier, this could be attributed to the fact that Pakistani men are often associated with strong religious practices and cultural differences, which could potentially contribute to stronger negative stereotypes and biases against Pakistani men in the workplace.

However, our study does have some limitations. Firstly, the constraints on time and resources in our study limited the depth of our findings. Moreover, the lack of real-life conditions in our experiment poses a challenge in drawing definitive conclusions within our setting. Another factor worthy to acknowledge is that our experiment was somewhat see-through, posing a possible threat to the reliability of the obtained results. However, as mentioned, our experimental design was influenced by several factors, one of which was the limitations posed by SIKT. Finally, due to a lack of skills and resources to utilize advanced statistical tools, we were limited to performing only certain types of analysis and providing constrained levels of detail. If we had more experience with advanced statistical tools, we could potentially have been able to provide more modified and explanatory analyses of results. Consequently, caution should be exercised when generalizing our findings to other groups and contexts.

Although our study has certain limitations, it contributes to the ever-increasing literature on the prevalence of racial bias in the labor market. Previous research has consistently highlighted the existence of such prejudice. However, our research suggests that this may not be the case in Norway among the younger generation who we have found to be more open-minded and accepting of people of different backgrounds. This is a positive sign for Norwegian society and suggests that we are making progress toward fair and equitable treatment of all human beings. If these results are indeed accurate, they imply that Norway is on the right track towards building an inclusive and diverse society, which values each person's contribution, regardless of their ethnicity, religion, or cultural background.

As a final point, the current research can be regarded as a preliminary study, which provides a foundation for future investigations. To expand on this research, it is recommended to replicate the study in various regions of Norway or other countries to assess the generalizability of the findings beyond the specific population and rather a population that can be generalized for all younger generations in the whole world. Furthermore, studying the impact of different recruitment processes, such as physical interviews, could be a valuable avenue for future research. A longitudinal study could also be conducted to examine the persistence or change in the absence of racial bias among university students over time. Additionally, exploring separately the impact of cultural and religious stereotypes on recruitment bias, and the effectiveness of anti-racism policies, and programs in reducing racial bias could contribute to a more profound understanding of the issue. Overall, further research is necessary to develop a more comprehensive understanding of the nature and extent of recruitment bias and identify effective strategies to address the issue.

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## 12.0 Appendix

### 12.1 Case-text

Bedriften du jobber for søker ny Senior Insurance Advisor. Den nyansatte skal lede et team av forsikringsrådgivere som tar seg av bedriftens prosjektforsikringer, personforsikringer, pensjonsordninger, operasjonelle forsikringsprogram og administrasjon av bedriftens egenforsikringsselskap. Du har fått i oppgave å velge ut hvem av de følgende 4 søkerne som blir innkalt til videre intervju.

### 12.2 Recruitment-text

Vinn gavekort på Sammen!!

Hei!

Vi er ein gruppe som går siste året på økonomi og administrasjon. Vi skal utføre eit eksperiment i forbindelse med bacheloren vår, og vi trenger deltakarar som går første og tredje året. Eksperimentet vil utførast måndag-fredag, 20.03-24.03, frå kl. 09 – 16.00. Måndag-onsdag vil eksperimentet ta stad på B110 og B108, torsdag-fredag på M311 og M314. Å delta vil berre ta nokre minutt av din tid, og du vil vere med i trekninga av gavekort på Sammen. Eksperimentet vil vere anonymt og det vil ikkje vere mogleg å kople dine svar til deg.

Håper du ønsker å delta!

## 12.3 Information form and consent form

### **Vil du delta i forskningsprosjektet**

#### **Bacheloroppgave**

av **Enes Gunay, Arshi Hasan, Reuben Sakarias Kjetland, Helene Vederhus**

Dette er et spørsmål til deg om å delta i et eksperiment i forbindelse med vår bacheloroppgave. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

#### **Formål**

Dette er et eksperiment i forbindelse med vår bacheloroppgave innen samfunnsforskning. Prosjektet har som formål å oversette forskning som tidligere er knyttet til arbeidslivet. Vi ønsker å se hvilken rolle studenter fra ulike kull ved høyere utdanningsinstitusjoner har i denne sammenhengen.

#### **Hvem er ansvarlig for forskningsprosjektet?**

Høgskulen på Vestlandet er ansvarlig for prosjektet.

#### **Hvorfor får du spørsmål om å delta?**

Du er en av 200 testpersoner i vårt samfunnsvitenskapelige eksperiment.

Hva innebærer det for deg å delta?

*«Hvis du velger å delta i prosjektet, innebærer det at du skal svare på noen spørsmål. Det vil ta deg ca. 5 minutter. Dine svar blir registrert gjennom papir og elektronisk»*

#### **Det er frivillig å delta**

Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykket tilbake uten å oppgi noen grunn. Alle dine personopplysninger vil da bli slettet. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

#### **Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger**

Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

Enes Gunay, Arshi Hasan, Reuben Sakarias Kjetland, Helene Vederhus, Eirik André Strømmland

Vi deler ingen filer med andre og lagrer datamaterialet på en sikker måte. Papirene du utfyller blir makulert og kastet.

Personopplysninger vil kun benyttes av oss når vi rekrutterer deltakere, registrerer resultatene og deler ut premie i etterkant. De vil ikke inngå i selve bacheloroppgaven.

#### **Hva skjer med personopplysningene dine når forskningsprosjektet avsluttes?**

Prosjektet vil etter planen avsluttes *når oppgaven blir godkjent*. Etter prosjektslutt vil datamaterialet med dine personopplysninger anonymisert. Resultatene fra eksperimentet kan muligens bli brukt til videre forskning. Selve personopplysningene som kan knytte svarene dine til din identitet vil slettes.

## Hva gir oss rett til å behandle personopplysninger om deg?

Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Høgskulen på Vestlandet har Sikt – Kunnskapssektorens tjenesteleverandør vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

### Dine rettigheter

Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke opplysninger vi behandler om deg, og å få utlevert en kopi av opplysningene
- å få rettet opplysninger om deg som er feil eller misvisende
- å få slettet personopplysninger om deg
- å sende klage til Datatilsynet om behandlingen av dine personopplysninger

Hvis du har spørsmål til studien, eller ønsker å vite mer om eller benytte deg av dine rettigheter, ta kontakt med:

Reuben Sakarias Kjetland ved telefon +47 917 59 585 eller  
Eirik André Strømmand ved telefon +47 555 85 607.

Vårt personvernombud: Arshi Hasan ved telefon +47 406 74 028

Hvis du har spørsmål knyttet til vurderingen som er gjort av personverntjenestene fra Sikt, kan du ta kontakt via:

Epost: [personverntjenester@sikt.no](mailto:personverntjenester@sikt.no) eller telefon: 73 98 40 40.

Med vennlig hilsen

Prosjektansvarlig

Eventuelt student

Eirik André Strømmand

Enes Gunay, Arshi Hasan, Reuben Sakarias Kjetland, Helene Vederhus

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## Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet Bacheloroppgave, og har fått anledning til å stille spørsmål. Jeg samtykker til:


- å delta i eksperimentet
- at svarene jeg oppgir blir lagret i konteksten av eksperimentet
- at opplysninger om meg blir brukt til å ta kontakt med meg.

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet

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(Signert av prosjektdeltaker, dato)

## 12.4 Example CVs

**Tor Nygård, 31 år** 

Adresse: Fjell lia 26

Utdanning: Master's in Executive Economic Administration

Relevant erfaring: 7,7 år

Jobberfaring ved siden av studiet: 2,7 år

Frivillig arbeid: 1,4 år

**Språk**

1. Norsk
2. Engelsk
3. Fransk


**Digitale Ferdigheter**

1. MS Office
2. Google drive
3. CSS

**Annet**

1. Førerkort klasse B
2. Kurs i social networking

1

**Cecilie Haugen, 33 år** 

Adresse: Trevelen 22

Utdanning: Master's in Strategic Leadership

Relevant erfaring: 7,6 år

Jobberfaring ved siden av studiet: 2,3 år

Frivillig arbeid: 1,6 år

**Språk**

1. Norsk
2. Engelsk
3. French


**Digitale Ferdigheter**

1. MS Office
2. Google drive
3. Java

**Annet**

1. Førerkort klasse B
2. Kurs i Creative thinking

26

**Amjad Mustafa, 32 år** 

Adresse: Hjort veien 18

Utdanning: Master in Applied Strategic Innovation

Relevant erfaring: 8,1 år

Jobberfaring ved siden av studiet: 2,6 år

Frivillig arbeid: 1,4 år

**Språk**

1. Norsk
2. Engelsk
3. Pashto


**Digitale Ferdigheter**

1. MS Office
2. Google drive
3. Oracle

**Annet**

1. Førerkort klasse B
2. Kurs i Creative Marketing

51

**Tahira Saeed, 31 år** 

Adresse: Fjellberget 20

Utdanning: Master in Applied Financial Management

Relevant erfaring: 8,4 år

Jobberfaring ved siden av studiet: 1,6 år

Frivillig arbeid: 2,4 år

**Språk**

1. Norsk
2. Engelsk
3. Arabisk

**Digitale Ferdigheter**

1. MS Office
2. Google drive
3. Adobe

**Annet**

1. Førerkort klasse B
2. Kurs i Human Resource Management

76

## 12.5 Questionnaire

### **Spørreskjema:**

Fyll inn opplysninger:

Kjønn:

Hvilken klasse går du i (årskull):

Hvor mange fagemner innen ledelse studerer du? (inkludert de du tar nå)

Hvilken spesialisering har du valgt eller vurderer å velge femte og sjette semester?:

Generell bachelor

Regnskap og skatt

Logistikk

Har du vært på utveksling eller vurderer å ta utveksling?

Ja

Nei

Vet ikke

## 12.6 Base of names used to generate names for the CVs

Norske fornavn		Pakistanske fornavn	
Gutter	Jenter	Gutter	Jenter
Kristian	Silje	Mohammad	Noor
Thomas	Kristine	Abdul	Fatima
Stian	Camilla	Ali	Shazia
Lars	Katrine	Syed	Rukhsana
Anders	Ida	Naseem	Samina
Andreas	Anne	Khalid	Nasreen
Kristoffer	Maria	Fazal	Razia
Alexander	Linn	Ahmad	Zubaida
Morten	Stine	Bilal	Zainab
Marius	Anette	Imran	Yasmin
Ole	Linda	Nasir	Saima
Martin	Marianne	Arshad	Nazia
Daniel	Elisabeth	Bashir	Shahnaz
Espen	Marte	Riaz	Farzana
Jan	Kristin	Rizwan	Tahira
Kim	Hanne	Zafar	Robina
Fredrik	Monica	Tariq	Rabia
Erik	Nina	Asif	Ayesha
Kenneth	Ingrid	Zahid	Zahida
Bjørn	Lene	Anwar	Shahida
Magnus	Line	Javed	Nusrat
Tor	Karoline	Khan	Bushra
Eirik	Hilde	Nazir	Shabana
Øyvind	Anna	Malik	Abida
Mats	Mari	Rahim	Asma
Joakim	Kristina	Hassan	Salma
Per	Therese	Farooq	Khalida
Vegard	Cecilie	Amir	Sana
Jon	Heidi	Irshad	Khadija
Kjetil	Hege	Mushtaq	Saira
Tommy	Jeanette	Khalil	Nadia
Hans	Tonje	Irfan	Zareena
Øystein	Trine	Amjad	Summera
Rune	Helene	Nadeem	Hina
Jørgen	Sara	Iqbal	Rani
Henrik	Carina	Tahir	Jamila
Tommy	Elin	Sultan	Noreen
John	Veronica	Shaukat	Farah
Andre	Ann	Waqas	Saba
Karl	Marie	Abdullah	Maryam
Jonas	Marit	Umer	Rizwana
Knut	Kine	Liaqat	Nargis
Håvard	Siri	Saif	Zeenat
Trond	Tina	Faisal	Humaira
Robert	Charlotte	Akbar	Shaista
Geir	Tone	Munir	Farida
Eivind	Ingvild	Usman	Ghazala
Michael	Anita	Faiz	Halima
Petter	Lise	Adnan	Haseena
Erlend	Marita	Waseem	Fauzia

Etternavn	
Norske	Pakistanske
Hansen	Khan
Johansen	Hussain
Olsen	Ali
Larsen	Ahmad
Andersen	Mohammad
Pedersen	Shah
Nilsen	Bibi
Kristiansen	Iqbal
Jensen	Nawaz
Karlsen	Akhtar
Johnsen	Abbas
Pettersen	Mehmood
Eriksen	Aslam
Berg	Gul
Haugen	Rehman
Johannessen	Ashraf
Andreassen	Hassan
Dahl	Saleem
Jørgensen	Akram
Halvorsen	Ramzan
Henriksen	Siddique
Lund	Parveen
Sørensen	Anwar
Jakobsen	Javed
Moen	Afzal
Strand	Hayat
Bakken	Masseh
Solberg	Asif
Iversen	Riaz
Rasmussen	Shahzad
Amundsen	Sharif
Berge	Farooq
Moe	Rasheed
Nygård	Haider
Fredriksen	Yousaf
Solheim	Saeed
Holm	Arif
Hauge	Mustafa
Knudsen	Ibrahim
Søæther	Nadeem
Hanssen	Malik
Haugland	Khalid
Danielsen	Majeed
Berntsen	Latif
Sandvik	Aziz
Thorsen	Usman
Birkeland	Tariq
Engen	Mahmood
Tveit	Yaseen
Bøe	Qasim

### 12.6.1 Norwegian names in the CVs

CV number	Name	Surname	Age
1	Tor	Nygård	31
2	Henrik	Larsen	31
3	Rune	Johansen	33
4	Kristian	Jakobsen	34
5	Andreas	Iversen	32
6	Eivind	Kristiansen	35
7	Mats	Berge	33
8	Trond	Kristiansen	33
9	Kjetil	Andreassen	31
10	Tor	Jacobsen	33
11	Henrik	Hansen	33
12	Kim	Halvorsen	33
13	Øyvind	Kristiansen	35
14	Kim	Sandvik	34
15	Joakim	Sørensen	32
16	Knut	Kristiansen	35
17	Tor	Dahl	33
18	Henrik	Rasmussen	32
19	Per	Henriksen	33
20	Tommy	Bøe	31
21	Morten	Nygård	32
22	Kenneth	Moen	32
23	Tommy	Eriksen	35
24	Espen	Nygård	32
25	Tor	Sørsæter	32
26	Cecilie	Haugen	33
27	Marianne	Lund	35
28	Ida	Kristiansen	35
29	Elisabeth	Strand	31
30	Marte	Amundsen	34
31	Lene	Lund	31
32	Kristin	Eriksen	35
33	Marit	Fredriksen	35
34	Kristine	Pedersen	34
35	Maria	Jacobsen	32
36	Maria	Andreassen	33
37	Tone	Amundsen	31
38	Silje	Olsen	35
39	Nina	Sørsæter	31
40	Camilla	Amundsen	31
41	Elisabeth	Fredriksen	35
42	Ann	Lund	31
43	Mari	Andersen	32
44	Anette	Halvorsen	32
45	Linn	Dahl	31
46	Helene	Hansen	34
47	Kristine	Thorsen	34
48	Trine	Hansen	32
49	Marit	Jørgensen	35
50	Elin	Danielsen	32



### 12.6.2 Pakistani names in the CVs

51	Amjad	Mustafa	32
52	Mustaq	Rehman	34
53	Safi	Hassan	34
54	Khalil	Sharif	31
55	Amir	Riaz	31
56	Abdul	Hayat	32
57	Abdul	Saleem	32
58	Farooq	Rehman	33
59	Mushtaq	Mohammad	34
60	Malik	Nadeem	33
61	Waqas	Saleem	33
62	Bilal	Ali	31
63	Zafar	Tariq	35
64	Khalil	Ahmad	34
65	Malik	Arif	32
66	Irfan	Akram	31
67	Nazir	Arif	35
68	Iqbal	Yousaf	35
69	Tariq	Aslam	31
70	Usman	Shahzad	32
71	Farooq	Mohammad	33
72	Mushtaq	Majeed	33
73	Mushtaq	Arif	31
74	Ahmad	Masseh	32
75	Faisal	Yousaf	35
76	Tahira	Saeed	31
77	Shahida	Tariq	35
78	Nadia	Abbas	33
79	Razia	Saleem	33
80	Rabia	Haider	31
81	Farzana	Asif	31
82	Rizwana	Latif	35
83	Shazia	Nawaz	32
84	Ghazala	Mustafa	32
85	Robina	Sharif	35
86	Sana	Latif	35
87	Bushra	Iqbal	33
88	Zareena	Riaz	34
89	Maryam	Mahmood	32
90	Zahida	Siddique	35
91	Farida	Saleem	32
92	Farzana	Akram	31
93	Robina	Riaz	32
94	Shahnaz	Asif	31
95	Farida	Saleem	31
96	Razia	Saeed	32
97	Nazia	Nadeem	32
98	Maryam	Sharif	34
99	Shabana	Hussain	33
100	Zeenat	Siddique	31

## 12.7 Base CV values before randomizing

<b>Main Resume Characteristics</b>					
<b>Avvik fra "mean"</b>	10 %				
<b>Qualification</b>	<b>Measurement</b>	<b>Amount (Mean)</b>	<b>Prosent HQ</b>	<b>Øvre grense</b>	<b>Nedre grense</b>
College degree	Years / Degree	5	100 %		
Volunteering experience	Years	1,5	100 %	1,4	1,7
Relevant work experience	Years	7,81	100 %	7,0	8,6
Work in school	Years	2,5	100 %	2,3	2,8
Computer skills	Amount	3			
Special skills	Number	2			
Languages	Minimum	3			
Age	Year	33	100 %	35	31

### 12.7.1 Addresses

<b>Adresse nr</b>	<b>Navn</b>	<b>Type</b>	<b>Tall</b>
1	Dal	Veien	8
2	Jern	Åsen	9
3	Rev	Gaten	10
4	Lyng	Lien	11
5	Fjell	Gaten	12
6	Stein	Bakken	13
7	Hjort	Flaten	14
8	Stang	Veien	15
9	Elve	Gaten	16
10	Jord	Vik	17
11	Hauk	Rud	18
12	Kolstad	Neset	19
13	Fjord	Plassen	20
14	Kalk	Berg	21
15	Spurv	Veien	22
16	Mowinckel	Havnen	23
17	Skogs	Bryggen	24
18	Tre	Kaien	25
19	Solberg	Veien	26
20	Natt	Sletten	27

### 12.7.2 Master's degree name components

Tittel	Attribute	Spesialisering
Executive	Economic	Management
Corporate	Strategic	Innovation
Applied	Analytic	Leadership
	Finance	Marketing
		Administration
		Consulting

### 12.7.3 Languages

Language	Language-Id	Language number
Norwegian	1	1
English	2	2
German	3	3
French	4	3
Spanish	5	3
Arabic	6	3
Urdu	7	3
Pashto	8	3
Hindi	9	3

### 12.7.4 Digital skills

Computer Skills	Factor
MS Office	1
Google drive	2
MySQL	3
Java	4
Oracle	5
HTML	6
CSS	7
Adobe	8

### 12.7.5 Other skills

Tittel	Attribute	Spesialisering
Førerkort B	Analytic	Marketing
Kurs	Creative	Thinking
Teamwork	Design	Management
	Social	Communication
	Human	Modelling
	Relations	Leadership
	Problem-solving	Innovation